Phasmida in Oceania

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Abstract

Nakata's 1961 paper on phasmids of Oceania is updated. The data is reviewed in a similar format to that of Nakata. A number of new records are included.

Key words

Phasmida, Oceania, distribution.

Introduction

It is some 38 years since Setsuko Nakata (1961) wrote her article on Phasmida in Oceania. Much of the information was obtained from papers by K. Günther since the 1920s. Prior to Nakata's paper the previous paper on the region appeared in 1953. Since 1961 a number of species have been collected in the region and some are in culture. This paper follows a similar format, and is intended to update Nakata's paper.

For the purpose of this paper Oceania includes Micronesia, Melanesia, Polynesia and Lord Howe Island, Chatham Island and New Zealand; Micronesia, East Melanesia, New Caledonia, Polynesia and Lord Howe Island are referred as oceanic islands in the Pacific.

New Guinea, Bismarck Archipelago, Solomon Islands, Louisiade Archipelago.

Herwaarden's 1998 paper on New Guinea phasmids gives 190 species and 17 subspecies; three more have been described subsequently (by Hennemann & Conle, 1998). New Guinea has only two more subfamilies than are found on oceanic islands (Lonchodinae and Aschiphasmatinae) but many more tribes, genera and species. Some genera absent in the oceanic fauna possess numerous species in New Guinea. The genus *Neopromachus* has 48 species, *Dimorphodes* contains 18 species and *Sipyloidea* ten species. There are nine species in the genus *Eurycantha* which is primarily restricted to New Guinea, Bismarck Archipelago and Solomon Islands, but a few species occur in Australia and one is known from New Caledonia. In 1993 Beccaloni described a new species of *Extatosoma* - *carlbergi* - from Wau, Morobe Province of New Guinea. Grösser (1991 & 1992) described three species of *Phyllium* - *brevipennis*, *chitoniscoides* and *elegans*.

The Bismarck Archipelago has 18 species recorded belonging to 13 genera. Some six of these species are also known from the Solomon Islands and one each from Micronesia, New Hebrides and New Caledonia. Two species are common to Fiji, while three others are known from the region stretching from the Sunda Islands to New Guinea.

Nakata reported 13 species of eight genera from the Solomon Islands, however Günther (1937) also recorded *Anchiale necydaloides* (Linnaeus) - now a junior synonym of *Phasma gigas* (Linnaeus). In 1977 and 1996, accompanied by Mary Salton, I made two trips to various islands and collected two species, one of the genus *Megacrania* from Rennell Island which may be a different species from those recorded i.e. *M. alpheus* (Westwood) or *M. phelaus* (Westwood). The second was a large winged phasmid possibly of the genus *Vetilia* was found on Gizo Island and New Georgia; efforts to bring this species into culture in 1977 failed. Also *Graeffea coccophaga* (Newport) was recorded by Redtenbacher (1908: 371), but this was probably a misidentification (Paine, 1968: 578) of *Ophicrania leveri* (Günther). One species from the Solomon Islands is now in culture as PSG 186: *Chondrostethus woodfordi* Kirby.

The Louisiade Archipelago, located south of the Bismarcks, has at least three species, one of which is an endemic *Eurycantha*.

Southeastern and Central Polynesia
Phasmids have not been recorded from the Hawaiian islands, Easter, Austral, Phoenix or Fanning. The widespread coconut pest, *Graeffea crouanii* (Le Guillou) occurs in the Marquesas and Mangareva, Tuamotus and Society Islands (Tahiti, Bora Bora) and the Cook Islands. A member of the genus *Hermarchus* also occurs on the Society Islands as well as Fiji, New Caledonia and Vanuatu (formerly New Hebrides).

Three species have been recorded in Tonga, one of which is an endemic *Cotylosoma*, a genus restricted to Fiji, Tonga, Tongatabu and Vanuatu. A penultimate instar female nymph of this genus was collected on Choiseul Island, Solomon Islands in 1988 by Evan Bowen-Jones; the specimen is in my collection.

Samoa
Samoa has two species of *Graeffea* recorded: *G. crouanii* and *G. minor* Brunner.

Fiji
Fiji has one of the richest phasmid faunas in the region: 21 species, eight of which are endemic, belonging to 11 genera. A species of the genus *Hermarchus* was cultured by members of the Phasmid Study Group (PSG), the culture is currently tentatively in culture as the result of a re-introduction.

New Caledonia
Nakata reported 24 species of 12 genera in five subfamilies, with Eurycanthinae predominating. In 1988 Donskoff described a new species, *Microcanachus matileorum*. Fifteen species are endemic and all are Eurycanthinae.

Loyalty Islands
Three main islands are close to New Caledonia and have a distinctive fauna of eight species belonging to eight genera.

Vanuatu (New Hebrides)
Seven species and two subspecies belonging to five genera are present in Vanuatu, four are also on Fiji, two on New Caledonia and one each on the Society Islands and New Britain. Two subspecies: *Megacrania batesii speiseri* Carl, and *Hermarchus inermis speiseri* Carl are endemic.

Lord Howe Island
This tiny island has, or had, five species of phasmid, two of which are endemic. They are *Karabidion australis* (Montrouzier) which is now believed to be extinct (Gurney, 1947), and *Parasosibia australica* Redtenbacher, which belongs to the South East Asian subfamily Necrosciinae which is otherwise absent from oceanic islands. Three Australian species also inhabit this island.

Chatham Island and New Zealand
A single species, *Argosarchus horridus* (White), also known from New Zealand, occurs on Chatham Island. Twenty-two species and subspecies are recorded from New Zealand (Salmon, 1991).

Table 1 - Genera found in the region.

GENERA	DISTRIBUTION
Family Phyllidae	
Subfamily Phyllinae	
1. *Chitoniscus*	Palau, New Guinea, New Britain, Fiji, New Caledonia, Loyalty Islands.
2. *Phyllium*	New Guinea.
Subfamily Heteropteryginae	
Tribe Obrimini	
3. *Heterocopus*	Palau, Ponape, New Guinea.
4. *Pterobrimus*	Fiji.
Family Phasmatidae	
Subfamily Tropidoderinae	
Tribe Tropidoderini	
1. *Extatosoma*	New Guinea, Australia, Tasmania, Lord Howe Island.
2. *Didymuria*	Australia, Tasmania, Lord Howe Island.
3. *Podacanthus*	Fiji, Lord Howe Island, Australia.
Subfamily Phasmatinae	
Tribe Phasmatini	
4. *Ctenomorpha*	Fiji, Australia, Tasmania.
5. *Phasma*	Solomon Isles, New Guinea.
Tribe Pharnaciini	
6. *Gigantophasma*	Loyalty Islands.
7. *Diagoras*	Palau Islands.
8. *Hermarchus*	Ponape, New Guinea, New Britain, Fiji, New Caledonia, Vanuatu, Society Islands.
9. *Cladomimus*	Loyalty Islands.
Tribe Acanthoxylini	
10. *Arphax*	Fiji, Eastern Australia.
11. *Clitarchus*	New Caledonia, New Zealand.
12. *Argosarchus*	Chatham Island, New Zealand.
Subfamily Eurycanthinae	
13. *Karabidion*	Lord Howe Island.
14. *Eurycantha*	New Guinea, Bismarcks, Solomons, New Caledonia [Australia - in error].
15. *Canachus*	New Caledonia, Vanuatu, Loyalty Islands.
16. *Paracanachus*	New Caledonia.
17. *Microcanachus*	New Caledonia.
18. *Asprenas*	New Caledonia, Vanuatu, Loyalty Islands.
19. *Labidophasma*	New Caledonia.
20. *Cnipsus*	New Caledonia.
Subfamily Xeroderinae	
21. *Nisyrus*	Fiji.
22. *Cotylosoma*	Fiji, Vanuatu, Tonga, Tongatabu.
23. *Leosthenes*	New Caledonia, New Guinea.
Subfamily Platycraninae	
24. *Megacrania*	Sri Lanka, Sumatra, Borneo, Philippines, Palau Island, Ponape, New Guinea, Admiralty Islands, Bismarcks, Vanuatu, Fiji.
25. *Acanthograeffea*	Seychelles to New Guinea, Marianas, Truk, Ponape.
26. *Graeffea*	New Guinea, Ponape, Australia to Marquesas and Mangareva.
27. *Brachyrhamphus*	New Caledonia, Loyalty Islands.
Subfamily Necrosciinae	
28. *Parasosibia*	Lord Howe Island, East India, Sri Lanka.
29. *Sipyloidea*	Solomon Isles.
30. *Orthonecroscia*	Solomon Isles.
Subfamily Pachymorphinae	
Tribe Pachymorphini	
31. *Pachymorpha*	Fiji, New Zealand, East Australia.

Taxon	New Zealand	Solomon Is.	Bismarck Arch.	Louisiade Arch.	Mariana Is.	Marshall Is.	Caroline Is.	Lord Howe Is.	New Caledonia	Loyalty Is.	Vanuatu	Fiji	Tonga	Samoa	Cook Is.	Society Is.	Tuamotu Arch.	Mangareva	Marquesas	Other localities
Phasmatinae Pharnaciini																				
Hermarchus																				
H. differens												X								
H. apollonius									X			X								
H. pythonius									X		X	X				X				
H. virga												X								
H. novabritanniae			X								X	X								
H. godeffroyi		X					X													
H. inermis inermis												X								
H. inermis speiseri											X									
Acanthoxylini																				
Clitarchus																				
C. hookeri	X								X											
Eurycanthinae																				
Eurycantha																				
E. horrida		X	X	X																New Guinea
E. calcarata		X	X						X											New Guinea
E. portentosa				X																
E. insularis		X		X																New Guinea
E. sifia																				Australia [Thursday Is.]
Canachus																				
C. alligator									X											
C. crocodilus									X											
C. harpyia									X											
C. salamandra									X											
C. tyrrhaeus									X	X	X									
Paracanachus																				
P. cerce									X											
Microcanachus																				
M. matileorum									X											
Asprenas																				
A. gracilipes									X											
A. femoratus									X											
A. brunneri									X											
A. dubius									X											
A. impennis									X											
A. sarasini									X											
A. effeminatus									X											
A. spinivestris										X										
A. crassipes											X									

Table 2. Updated version of Nakata's (1961) Table 2. The distribution of the species in four widespread genera: *Hermarchus*, *Eurycantha*, *Megacrania* and *Graeffea*, and four restricted genera: *Clitarchus*, *Canachus*, *Asprenas*, and *Cotylosoma*.

Taxon	New Zealand	Solomon Is.	Bismarck Arch.	Louisiade Arch.	Mariana Is.	Marshall Is.	Caroline Is.	Lord Howe Is.	New Caledonia	Loyalty Is.	Vanuatu	Fiji	Tonga	Samoa	Cook Is.	Society Is.	Tuamotu Arch.	Mangareva	Marquesas	Other localities
Xeroderinae																				
Cotylosoma																				
C. godeffroyi													X							
C. sp. indet.		X																		
C. dipneusticum												X								
C. amphibius											X	X	X							
C. carlottae											X	X								
Platycraninae																				
Megacrania																				
M. batesi batesi		X				X	X													Admiralty Is., Key Is., New Guinea
M. batesi speiseri											X									
M. alpheus			X																	Sri Lanka, Aru Is., Philippines
M. pelaus												X								
Graeffea																				
G. crouanii							X		X			X	X	X	X	X	X	X	X	
G. lifuensis										X										
G. minor												X		X						

Table 2 (continued - caption on page 16).

Micronesia

There are few records for phasmids in Micronesia with seven having been recorded from Caroline Islands (four from Ponape, one from Truk, four from Palau), one from the Mariana Islands (Pagan, Saipan, Rota and Guam) and one from the Marshall Islands. The five endemic species in Micronesia are distributed as follows: *Diagoras ephialtes* Stål in Palau, *Acanthograeffea denticulata* Redtenbacher in the Mariana Islands, *A. modesta* Günther in Truk, *Hermarchus godeffroyi* Redtenbacher in Ponape and *Heterocopus leprosus* Redtenbacher from Palau and Ponape Islands. A species of *Megacrania* is found on Ebon Atoll, Marshall Islands (Gressitt, 1954) and one species *Graeffea* on Angaur, Palau Islands (Esaki, 1940). A species of *Chitoniscus* is reported and a species of *Diagoras* is endemic to Palau Island.

Argosarchus	Chatham Island, New Zealand.
Acanthoxyla	New Zealand.
Pseudoclitarchus	New Zealand.
Clitarchus	New Caledonia, New Zealand.
Pachymorpha	Fiji, New Zealand, East Australia.
Mimarchus	New Zealand.
Tectarchus	New Zealand.
Spinotecarchus	New Zealand.

Table 3 - Distribution of New Zealand genera.

Discussion

Since the publication of Nakata's paper several trip have been made by PSG members to various islands in the region. Tony James has visited Fiji and New Caledonia; a species of the genus *Hermarchus* was brought into culture and remained so for a number of years. For myself, I have been fortunate enough to visit the region on a number of occasions: New Guinea (twice), Solomon Islands (twice), Fiji, Vanuatu, New Caledonia, New Zealand and the Loyalty Islands. Numerous species were collected in New Guinea including members of the genera: *Eurycantha*, *Anchiale*, *Phasma*, *Neopromachus*, *Extatosoma*, and various unidentified species. Of these *Eurycantha calcarata* is still in culture, *Extatosoma popa* and *Phasma gigas* are currently tentatively back in culture. *Anchiale maculata* is unfortunately no longer in culture. Other species have been acquired via various agencies and *Eurycantha coriacea* and *E.* sp. (PSG 44) are in culture. Efforts to culture *Hermarchus biroi* by several PSG members failed when nymphs refused all foodplants.

Two visits to various islands of the Solomon resulted in the following species being collected: *Megacrania* sp., one series from New Georgia and one from Rennell Island, *Sipyloidea poeciloptera*, *Orthonecroscia ruficeps*, *Hermarchus godeffroyi*, a *Vetilia* sp. and *Chondrostethus woodfordi*. Only the last species is in culture, it is a fern eating species. In the case of the other species only *Vetilia* sp. laid sufficient eggs to start a culture. However, the eggs failed to hatch.

Some observations on the biology of the phasmids have been made. Paine (1967) reported *C. woodfordi* (as *Myronides woodfordi*) frequently in the forest and collected from palms. He was unable to determine the foodplant which I determined to be ferns of various species on New Georgia and Guadalcanal. It was also seen to be feeding on an undetermined dicotyledonous plant, and was diurnally active. *Hermarchus godeffroyi* was stated by Paine to feed on *Hibiscus tiliaceus* though my efforts to feed the insects in captivity failed. The species of *Vetilia* was found on an isolated guava tree (*Psidium guajava*). The foodplants of the *Sipyloidea* and *Orthonecroscia* were not discovered.

On Vanuatu two species of phasmids were discovered. A *Hermarchus* sp. from Erromango Island which is currently tentatively in culture feeding on the following foodplants - bramble (*Rubus* sp.), evergreen oak (*Quercus sobus*), and *Eucalyptus gunnii*. A species of *Graeffea* was found on Efate Island feeding on *Pandanus* palms principally, although *Cocos nucifera* was an alternative foodplant in the wild. This is tentatively being reared on *Euterpe* sp., a South American palm.

Searching on Lifu Island, one of the Loyaltys, produced no phasmids. Collecting on Mount Koghi in New Caledonia resulted in several specimens of *Canachus* being found but unfortunately they produced no eggs and, because of the travel arrangements being via New Zealand, they were released.

No species have been recently collected in New Zealand (an attempt by Virginia Cheeseman to culture *Pachymorpha hystriculea* (Westwood) in 1991 was unsuccessful) although *Acanthoxyla inermis*, *A. geisovii* and *Clitarchus hookeri* are established in south-western England and the Scilly Isles. These three species have proved to be difficult to culture in captivity indoors, though less difficult if reared outside, and feed on rose, loganberry, hawthorn, and *Cryptomeria* sp.

I have no doubt that intensive collecting in New Guinea and especially in Irian Jaya (politically part of Indonesia) will produce many species, some of which will undoubtably be new to Science.

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